DOCUMENT RESUME

ED 323 914 IR 014 537

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TITLE A Research Approach to the Identification, Clarification, and Definition of Visual Literacy and Related Concepts.
PUB DATE Feb 90
NOTE 17p.; In: Proceedings of Selected Paper Presentations at the Convention of the Association for Educational Communications and Technology; see IR 014 535.
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Delphi Technique; *Visual Aids; *Visual Learning; *Visual Literacy
IDENTIFIERS Conceptual Analysis

ABSTRACT

The goals of this study were to identify the constructs of visual literacy, to determine the amount of agreement or disagreement which exists concerning the identified constructs, and to provide a measure of relative importance among the identified constructs. The Delphi technique was employed to elicit information and opinions from a panel of visual literacy experts. A set of statements based upon the initial input of that group was further refined by the group through successive Delphi iterations. While the Delphi process was central to this research, basic Delphi techniques were expanded to include an extensive instrumentation phase and a validation of the results of the Delphi study through a readministration of the instrument with a different group of subjects. Among the conclusions are that: (1) the Delphi technique proved to be an appropriate methodology for identifying visual literacy constructs; (2) the Delphi technique was appropriate for bringing visual literacy experts to consensus regarding the elements, concepts, and constructs of visual literacy; (3) the very strong correlation between the level of agreement and the level of consensus indicates that there is the most agreement on those constructs which are the most highly accepted; (4) the set of agreed-upon statements emanating from this study can be the basis for restructuring a coherent theoretical base for visual literacy; and (5) notwithstanding statements to the contrary in the literature, there is a high level of agreement on most factors associated with visual literacy. (21 references) (GL)

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Title:

A Research Approach to the Identification, Clarification, and Definition of Visual Literacy and Related Concepts

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A Research Approach to the Identification, Clarification, and Definition of Visual Literacy and Related Concepts

Abstract

This paper presents a report of a multi-phase research project which was conducted to provide a comprehensive description of visual literacy, its constructs and components. The Delphi technique was employed to elicit information and opinions from a panel of visual literacy experts. A set of statements based upon the initial input of that group was further refined by the group through successive Delphi iterations. While the Delphi process was central to this research, basic Delphi techniques were expanded to include an extensive instrumentation phase and a validation of the results of the Delphi study through a readministration of the instrument with a different group of subjects. A brief discussion of the background of visual literacy and a description of the Delphi methods used are included, followed by a report of the procedures employed in this project and the results of the study.

A Research Approach to the Identification, Clarification, and Definition of Visual Literacy and Related Concepts

Introduction

Visual literacy is a familiar term to the majority of individuals in the fields of education and educational technology. However, the term may mean far different things to different individuals. For more than two decades the charm of visual literacy as a general notion has exceeded its popularity as a defined (ill defined?) entity. Is visual literacy a set of skills? Is it a field of study, an academic discipline? Is it a metaphor, a misnomer, or just a mystery? These and many other questions regarding visual literacy have lacked definitive answers. This paper presents a report of a multi-phase research project which was undertaken to address some of the questions surrounding visual literacy.

Origins of Visual Literacy

In 1969 the first visual literacy conference was held at Rochester, New York. John Debes was the driving force behind that meeting and his seminal paper, "The Loom of Visual Literacy" (Debes, 1970), set the visual literacy movement in motion. The idea of visuals as a language was recorded in an Eastman Kodak publication in 1971. Visual thinking was advanced as a related concept the next year (Arnheim, 1972). And the following year Donis Dondis' classic text, *A Primer of Visual Literacy*, appeared (Dondis, 1973). By 1976 the term visual literacy (VL) had become a buzzword. In August of 1976 the theme of the twenty-second Lake Okoboji Educational Media Leadership Conference was "Visual Literacy -- The Last Word" (Cureton & Cochran, 1976). But it wasn't the last word. Although the Okoboji participants stated that "Before research can begin, a common definition of the term 'visual literacy' should be developed". (p. 99), no widely accepted (thus common) definition resulted from that conference.

Attempts at Definition

Debes himself initiated the ongoing definitional troubles. He wrote that "When I say 'visual literacy,' what I have in mind is a great dim shape, the outlines of which and the importance of which are not yet clear" (1970, p. 1). Debes agreed to write the first definition of VL with the caveat that the definition was tentative and "sure to be changed" (1970, p. 14). Dondis may have reinforced the general reluctance to create a sharply focused **common** definition when she advised, "One of the major pitfalls in developing an approach to visual literacy is trying to overdefine it (1972, p 9)."

Since those early days, the definitions of VL have varied widely. Some of the more recent definitions include only a narrow range of elements while others contain many. Some writers and practitioners have addressed only understanding visuals, others have included understanding and creating visuals, while still others have included a much broader range of abilities. Hortin, for instance, stated that VL includes the abilities required to "learn, understand, think, communicate and store information in one's mind visually" (1980, p. 21). In a definition deliberately structured to incorporate the essentials of visual thinking, visual learning, and visual language, Hortin and Braden offered this definition: "Visual literacy is the ability to understand and use images, including the ability to think, learn, and express oneself in terms of images" (1982, p. 169). As Baca and Braden noted, "even that definition

fails to directly address design, creativity, and aesthetics as they apply to visualization." (1990, p. 100).

While the term *visual literacy* has endured, after those first few years the concept has gained few new advocates. There has been no disputing the fact that visuals can be used in communication. There has been no challenging of the basic premise that principles related to using and understanding visuals can be taught and learned. The inherent wholesomeness of VL remains, but not without challenge.

Criticisms

Over the years visual literacists have lauded the precepts of visual literacy, while others increasingly have asserted that VL is not a viable concept. The detractors have made an issue of rejecting VL entirely. Suhor and Little suggested that VL is "...not a coherent area of study but, at best, an ingenious orchestration of ideas" (1988, p. 470). Cassidy and Knowlton labelled visual literacy a "failed metaphor" and offered the proposition that "Visual Literacy (VL)--as a metaphor, as a concept, and as a movement--is a paradox. ...in the sense of [being] inherently contradictory". They asked "What is VL, or, by the criterion of a profitable science and technology, what might it become if it is to serve as an abundant generator of questions, hence a guide to fruitful research?" (1983, p. 67).

The aspects of VL which are most frequently criticized include its *theoretical foundations* and the *research* which has been conducted in the field. Hocking (1978) addressed the paucity of experimental research in the field thus:

> Much of the literature available fell within the realm of hypothesizing and undocumented personal opinion. ...Some research has been background research concerning the rationale behind Visual Literacy; and much of the field research has been without the tight control of experimental design. ...the tremendous amount of information published on a topic that crosses so many fields and disciplines prevents any hope of exhaustiveness... (pp. 10-11).

Clearly these and other criticisms relate to the expansiveness of VL and the failure of the field to clearly identify its components. Description and definition are at the root of many of the objections to VL. A comprehensive description of the components of visual literacy and of the ideas related to it might provide some structure for research that would validate the field. Cassidy and Knowlton called for a description of visual literacy which could provide direction for future research. They stated that "...if from the VL arena someone would step forward and offer conceptual and operational definitions of VL (no matter how incomplete and tentative), honest-to-goodness research work could begin" (1983, p 84). Spitzer and McNerny called for an operational definition of visual literacy, claiming that without one "...the nature of the construct is speculative, ambiguous, and too prone to misinterpretation" (1975, p. 31). Hocking stated that "The enumeration of the skills of Visual Literacy [would] help define the discipline" (p. 13).

Proliferation of "literacies"

First there was literacy. It had to do with the ability to read and write words. Then the concept was expanded to include aspects of being well read. When the term "visual literacy" was coined the conceptual door was thrown open. Other adjectives have been linked since to literacy, the most ubiquitous being "computer." Recently the term *media literacy* has been introduced -- and, as defined by Tyner (1989), that term would subsume VL.

As recently as the autumn of 1989 a call for papers for a London symposium contained the following opening paragraph:

> The term "literacy" is invoked by diverse groupings of academics, educationalists and media producers who want to see established concerns with print media extended to cover the fields of television, film, radio, video, audio, photography, graphic design and computer software. But do we all mean the same things by "literacy"? What is entailed, conceptually and politically, in extending its usage to all media forms? (IVLA, n.d.)

Proliferation of literacy terms only compounds the identity problems for VL. Yet the phenomenon has its lighter side. One of the participants in this research used the term *sexual literacy*, but no reference to it has been noted in the literature. (We can only hope that the latter term does not survive. How would we know what to classify as reading and what as writing?)

Many of the scholars who have addressed the theoretical foundations of VL have asserted that the basis for the concept of visual literacy has been derived by borrowing from a diversity of fields, including education, philosophy, perception, art theory, linguistics, and human developmental theory (Debes, 1970; Hocking, 1978; Hortin, 1980). In the process, however, VL has not [in the opinion of the present authors] created a substantial theory base or research identity of its own that commands academic respect.

Research Goals

The goals of this study were to identify the constructs of visual literacy, to determine the amount of agreement or disagreement which exists concerning the identified constructs, and to provide a measure of relative importance among the identified constructs. The following research questions were developed to enable these goals to be met.

1. What are the elements of visual literacy?

2. How much agreement exists concerning the identification of the constructs which are elements of visual literacy?

3. Given the constructs identified as elements of visual literacy, how important is each construct considered to be by persons active in the visual literacy field?

The Delphi Method

The Delphi technique is a research method which is used to elicit the input of a group of individuals and to pool their collective knowledge in order to formulate a group judgment or statement of opinion. The process is designed to maximize human intellect while attempting to minimize interpersonal dynamics. A major anticipated effect of the procedure is to generate a better estimate or a more sharply-focused opinion than can be expected from a single individual or from a group dominated by and individual.

Original Purpose

The Delphi technique was originally used for forecasting future developments. One notable example of such an application was the use of the method by the United States

military for long-term threat assessment (Dalkey, 1969). When the Rand Corporation first conducted studies for the Department of Defense, they also conducted extensive tests to validate the methodology and reported these tests in a series of reports (Dalkey, 1969; Brown, Cochran & Dalkey, 1969; Dalkey, Brown & Cochran, 1969; Dalkey, Brown & Cochran, 1970).

The validation studies performed by the Rand Corporation utilized "almanac type" (factual) questions with identifiable "correct" (quantitative) answers. The studies showed that, with reiteration, the group estimate (identified as the median of the responses) became more accurate. Further, the diversity of answers narrowed toward a greater degree of consensus or agreement (Dalkey, 1969, p. 20).

Other Uses

The Delphi technique is now commonly applied in situations in which there exists knowledgeable opinion rather than questions about hard information for which there are specific correct answers. Recently, the Delphi technique has been applied in fields such as management, education, and medicine. It is used as a decision making process in formulating policy statements, in forecasting future technological developments of technologies and their applications, in risk assessment, and in curriculum development. Not only is the technique being used in a growing number of settings, wherever used, the Delphi process tends to generate statements which are better accepted than those derived through direct forms of interaction (Dalkey, 1969, p. 17).

The Delphi technique is particularly useful when an attempt is being made to achieve one of the following purposes:

> ...(a) determining or developing a range of possible alternatives, (b) exploring or exposing underlying assumptions or information leading to various judgments, (c) seeking out information that may generate a consensus on the part of the group involved, or (d) correlating informed judgments on topics spanning several disciplines (Harrison, 1987, p. 278).

Thus, the Delphi technique appeared to have promise for resolving the issue of visual literacy. The techniques were assumed to be an appropriate method for correlating informed judgments and identifying (and perhaps generating) consensus among scholars who study visual literacy.

Procedure for this Study

In the research reported here, the Delphi technique was the primary method employed to develop a comprehensive description of visual literacy. However, this research project was expanded beyond the Delphi study to include two phases. Phase one began with the development of an instrument which could be used to poll the opinions of a group of experts who participated in a Delphi study. The reactive phase of the study followed, in which the participants rated the statements on the instrument. Phase two validated the results of the Delphi study by asking a different population to rate the items on the same instrument.

Phase I: The Delphi Study

The procedures for selecting participants and developing the instrument were somewhat more elaborate than those described by Isaac & Michael (1981, p. 114-115). Their five step

procedure for conducting a Delphi study was followed, except the opinion-gathering step was terminated at two rounds when early consensus was reached.

Population. The Delphi technique is a method for pooling the opinions of a group of experts. Therefore, the selection of subjects who would participate in this study involved the identification of a group of persons who could be considered experts on the topic of visual literacy. This selection was accomplished in the following manner:

1. A list of names was compiled which included:
   a. all the people who had published one or more articles in *The Journal of Visual-Verbal Languaging* (*JVVL*) in the previous five years,
   b. the people who had published in the readings from International Visual Literacy Association (IVLA) annual conferences between 1984 and 1988, and
   c. the participants at the IVLA Symposium on Verbo Visual Literacy which was held in Stockholm, Sweden, in 1987.

2. This list, which included two hundred seventeen names, was sent to the eight members of the 1988 Executive Board of the International Visual Literacy Association. Each member was asked to select from the list and to add other names in order to identify thirty persons whom they felt were knowledgeable about visual literacy or had made significant contributions to the field and could be considered "experts". A total of eighty-eight people were identified as having a degree of expertise adequate to be asked to participate in the Delphi study.

An invitation to participate in the Delphi study was sent to each of the eighty-eight people identified in this manner. The letter of invitation included a brief discussion of the Delphi technique and emphasized that a Delphi study is a long process for both the researcher and the participants. The recipients of this letter were asked whether or not they were able and willing to commit the time which would be required to complete the study. Of the eighty-eight invitations which were sent, seventy-three responses were received; fifty-nine of those responses were from people who agreed to participate in the study.

Instrumentation. A review of the literature was conducted to identify questions, concerns, and ideas which had been addressed as aspects of visual literacy. Based upon this literature review, twenty-six broad questions were formulated. These questions were to be used as stimuli for the respondents' statements of opinion regarding visual literacy constructs. A final question was added which asked the participants to identify areas of concern which were not addressed by the stimulus questions. This final question and the unstructured format for the responses were utilized in order to take this study beyond the limits of the existing literature and to benefit fully from the expert knowledge and opinions of the Delphi participants.

The participants were asked to respond to the questions with written answers. This diverges somewhat from the procedure usually employed in a Delphi study. It is more common for the researcher to formulate a tentative list of statements, thus making analysis of the responses much more manageable. In this case, providing such a list might have limited the ideas and constructs addressed by the participants and was, therefore, judged not to be congruent with the goal of providing a comprehensive description of visual literacy. However, since the responses were to be written by each participant, asking busy

professionals to respond to twenty-seven questions would have made unreasonable demands on their time. Therefore, the questions were divided and six sub-forms were created, each of which contained seven questions. Of those seven questions, five were asked of only some of the participants, while the two broadest questions were on each sub-form. These two questions, asked of every participant, were:

> Provide a definition of visual literacy which is acceptable to you. It may be your own, someone else's, or one which you have modified. Some elements you may wish to include are: abilities to..... with (elements)..... for (purposes)..... using (tools).....
>
> What other concerns, opinions, questions etc. regarding the nature and/or the limits of visual literacy would you like to see addressed in this study? You might consider things I have left out in regard to a definition of the term, visual literacy as a field, visual language, the practice of visual literacy, educational implications, and visual literacy research.

Each participant was sent the master list of all twenty-seven questions and a shorter form consisting of seven questions. Participants were asked to answer all the questions on their short form and as many from the master list as their time and interest allowed. The final question on each short form asked every participant to examine the master list in order to identify aspects of visual literacy which were not already being adequately addressed. In addition, an extensive list of terms which might serve as stimuli was included. This list included terms which could be identified in the literature as related to visual literacy. Round One of the Delphi study thus consisted of a master list of twenty-seven questions, one of six short forms which each included seven questions, a list of terms, and a cover letter. This was sent to the fifty-nine participants in May, 1989.

Fifty-four responses to the questionnaire used in Round One were received. Each statement (many of which were quite lengthy) was broken into individual concepts. More than 1,600 concepts were identified in the responses to Round One. Because of the large number of items which needed to be included, the form was organized by grouping portions of statements. An effort was made to preserve as much of the original language of the participants responses as possible. This form included broad areas (constructs) and as many supporting details as could be identified and organized into the framework provided by the constructs. When completed, the form contained four hundred ninety-one items. That number was far too many considering that the participants were volunteers who might be overpowered by the task of evaluating so many statements.

The concepts were collapsed once more, losing some but not all of the participants' original phrasing. The revised form was structured as a questionnaire with 186 items -- still more items than desired, but much better than the trial form. Items were listed as statements, each to be rated for agreement/disagreement on a four-point Likert-type scale. This final form was the opinion gathering instrument used in the next two Delphi rounds.

Data Collection

On the two iterations of the Delphi study which utilized this instrument, the participants were asked to rate each statement (or portion of a statement) on a scale from 1 to 4, indicating the extent to which they agreed that the statement identified or elaborated upon an element of visual literacy. The respondents were asked to use the following values for the scaled responses. A response of "4" indicated strong agreement ("agree strongly"), "3" indicated mild agreement ("agree somewhat"), "2" indicated mild disagreement ("disagree

somewhat"), and "1" indicated strong disagreement ("disagree strongly"). In Round Two, participants were encouraged to make written comments or to suggest re-phrasing of statements.

Data Analysis Methods

The distinctive characteristics of a Delphi study are 1) no face to face interaction between participants during the study, and 2) reiteration with statistical feedback. The statistical feedback consists of a summary of the group's previous responses, provided by including the extremes of the interquartile range (Q_1 and Q_3) and, for each individual, his or her previous response to each item. Including the first and third quartiles on the next round of the Delphi study gives the participants information on the range of answers selected by the central fifty percent of the group (from Q_1 to Q_3). This information was added to each item for Round Three.

In addition to feedback, the Delphi procedure requires data for the determination of *level* of agreement and *degree* of agreement for every item considered. Consequently, a set of simple statistics was generated from the Round Two responses:

	Statistic	Purpose
Q_1	upper limit of the first quartile	feedback
Q_3	upper limit of the third quartile	feedback
IQR	the interquartile range	degree of consensus
M	mean rating	level of agreement

For Round Three the IQR and M were computed. Q_1 and Q_3 were available but were not utilized since the Delphi procedure was terminated prior to a fourth round.

On Round Three, the Delphi participants were asked to re-rate each statement, this time considering the group's response and their own response on the previous round. They were also given the opportunity to make comments about the items for which their rating fell outside the interquartile range. Forty-three responses to Round Three were completed and returned. The interquartile range and the mean for each item was computed from these responses.

A *t*-test was performed on the summed means of all the items on Round Two and the summed means of all the items on Round Three to determine whether a statistically significant change in the ratings had occurred. There was found to be no significant difference (t=1.81, df=91, p.=.074) between Round Two (M=632.58, n=50) and Round Three (M=657.33, n=43); therefore, the Delphi study was concluded. (Had the difference been significant, another round would have been administered.)

Phase II: Validation

Phase II of this research project utilized a different population and involved re-rating the visual literacy concepts identified by the Delphi population. There were two goals for

this phase of the project. The first was to validate the Delphi study by asking another group to rate the items on the instrument. The second goal was to provide a measure of importance of the items which were accepted as constructs of visual literacy during the Delphi study.

Population. Since a major goal of Phase II was to validate the results of the Delphi study, it was important that the subjects involved in this phase be both concerned with and informed about visual literacy. Therefore, the members of IVLA (as of October, 1989) who had not participated in the Delphi study were used as the population. Questionnaires were sent to one hundred eighty people.

Instrumentation and data collection. The list of statements which was used in the Delphi study was used as the instrument for this phase of the study. Because one of the goals of Phase II was to validate the Delphi study, the items which had been rejected by the Delphi participants (those with a mean of less than 3.0 on Round Three) were included in this phase. The statements were still accompanied by a four point Likert-type scale, but this time the respondents were asked to rate each item as to how important they felt each item to be.

Data analysis methods. The responses to the instrument during the validation phase were compared with the final responses to the Delphi study to determine if there was a significant difference in the ratings of the items. A *t*-test was performed on the summed means of the responses to all the items to determine whether there was a significant difference in the responses to the instrument as a whole. In addition, a *t*-test was performed on each individual item, comparing the mean response of the Delphi participants with the mean response from the validation group.

An *F*-ratio was computed to determine if the variance in the responses to the instrument during the validation phase was significantly different from the variance in the responses to the instrument on both iterations of the Delphi study.

Results

Information Resulting from the Delphi Study

The results of the Delphi study provide two types of information for each item: 1) the degree of consensus, and 2) the level of acceptance. These results are based on the statistical analysis performed on the final round. The interquartile range on the final round was used as the measure of the degree of consensus concerning whether each item identifies a construct of visual literacy. The items may then either be ranked by degree of consensus or arranged into groups by degree of consensus. The level of acceptance was used to determine the inclusion or exclusion of an item in the final list of constructs which define the field of visual literacy.

The measure of the *degree of consensus* on an item is the interquartile range. The interquartile range is figured by subtracting Q_1 from Q_3, thus identifying the range of responses among the central 50% of respondents. The smaller the interquartile range, the greater the degree of consensus. The larger the interquartile range, the less the degree of consensus.

The measure of the *level of acceptance* for each item is the measurement of group rating of an item; either the median or the mean for each item may be used. A level at which each item is accepted as a construct of visual literacy was established for this study. Items meeting or exceeding that level were accepted as a construct of visual literacy. Items falling below

that level were rejected as constructs of visual literacy. In this study, to be accepted an item must have achieved a mean of at least 2.98 to be accepted (an arbitrary criterion derived by calculation of the .05 alpha level of all means of the final round). Any item with a lower mean was considered to have been rejected by the Delphi panel.

The level of acceptance and the degree of consensus may be independent of one another. It is possible, for instance, for there to be an extremely high degree of consensus (interquartile range of .5) regarding an item which is rated low enough to be rejected (M=2.97 or lower). However, the correlation between the level of acceptance and the degree of consensus for this study was found to be quite high (r=.908).

Statistical Analysis of the Visual Literacy Delphi Study

Changes in Degree of Consensus. In order to determine whether or not there had been a significant convergence toward consensus as a result of the Delphi process, the variance on Round Two was compared with the variance on Round Three. A decrease in variance on Round Three would indicate a convergence toward consensus; such an observation could then be tested for statistical significance by computing an F-ratio.

An F-ratio was computed to determine if the variance in the responses to Round Two was significantly different from the variance in the responses to Round Three of the Delphi study. The difference in the variance for the instrument as a whole (all 186 items) was found to be statistically significant (F=2.33, df=49/42, p=.003) between Round Two (var=5868.94, n=50) and Round Three (var=2521.04, n=43). The decrease in the variance (computed by squaring the standard deviation) shows a significant move toward consensus.

Non-Statistical Results of the Delphi Study

While statistical feedback on each reiteration of a Delphi study is a vital component of the methodology, the results of such a study are not necessarily reported statistically. Frequently the statements are grouped and identified as those items upon which there exists high, medium, and low degrees of consensus. An alternative is to rank the statements in order of the degree of consensus.

For many researchers, the most exciting aspect of a study is the possibility of contributing to the resolution of the question which stimulated the study. The opportunity to address the questions "What does this mean?" and "So what?" is usually confined to the discussion in the section of the report which presents conclusions drawn from the study. However, it is important to keep in mind that the goal of a Delphi study is to create a statement based upon group opinion and that such a statement is the true "result" of a Delphi study.

Arbitrarily, the authors have chosen to limit discussion of specific VL constructs to the "top ten percent." The nineteen statements regarding visual literacy elements, concepts, or constructs for which there was the highest level of agreement and the nineteen statements about which there was the highest degree of consensus are correlated 1:1. Not only are the statements the same, the rank orders of agreement and degree of consensus are identical. Those nineteen statements are (in descending rank order):

1. Within the context of visual literacy, a *visual* which is *visible* may include iconic, pictorial representations.

2. Visual literacy refers to the use of visuals for the purposes of communication.

3. Within the context of visual literacy, a *visual* may be seen with the eyes (visible).

4. Within the context of visual literacy, a *visual* which is *visible* may include man-made objects.

5. Within the context of visual literacy, a *visual* which is *visible* may include natural objects.

6. Within the context of visual literacy, a *visual* which is *visible* may include events.

7. The processes humans engage in to practice visual literacy (use visuals for the above purposes) include responding to visuals.

8. Designing visuals includes using the elements of visual design such as color, line, form, shape, light.

9. Responding to visuals may be done mentally.

10. Using visuals in communication may provide a means of communicating other than verbally.

11. Using visuals in communication may enhance communication by combining visual and verbal elements.

12. Within the context of visual literacy, a *visual* which is *visible* may include actions.

13. Designing visuals includes applying the principles of composition such as balance, rhythm, repetition and unity.

14. Designing visuals includes using visual cues to indicate movement, passage of time, distance.

15. Perception of visuals includes attending to the visual stimuli.

16. The influences upon meaning may lie within the interactions among these elements [within the viewer, within the visual image, within the context of the presentation, within the context of sociological influences].

17. Visual literacy involves the affective domain in that attitudes and emotions can be evoked with visuals.

18. The *study of* visual literacy involves the relationship among the components of research, theory, and implementation.

19. Within the context of visual literacy, a *mental visual* includes pictorial images.

[Note: The complete list of accepted statements is available to other researchers when requested directly from the authors.]

Results of the Validation Phase

Rating of entire instrument. A *t*-test was performed on the summed means of all the items on Round Three of the Delphi study and the summed means of all the items on the final administration of the instrument. The difference in the mean responses was found not to be

statistically significant (t=1.40, df=71, p=.123) between the results of the Delphi study (M=657.33, n=43) and the final administration (M=629.37, n=30).

Rating of individual items. A t-test was performed on each individual item to identify those statements which were rated significantly differently by the two groups. There was found to be a significant difference in means on 35 of the statements. No significant difference was found in the mean rating of 151 items.

Consensus. An F-ratio was computed to determine if the variance in the responses on each iteration of the Delphi study was significantly different from the variance in the responses on the final administration of the instrument. The results were:

There was found to be no statistically significant difference (F=1.74, df=49/29, p=.085) in the variance among the responses to the first iteration of the Delphi instrument (var=5868.94,n=50) and the validation phase administration (var=10,219.59,n=30).

The differences in the variance for the instrument as a whole (all 186 items) was found not to be statistically significant (F=4.050, df=42/29, p<.0005) between the results of the final iteration of the Delphi study (var=2521.04,n=43) and the validation administration (var=10,219.59,n=30).

Conclusions

1. The Delphi technique proved to be an appropriate methodology for identifying visual literacy constructs. The 186 statements generated in the first round yielded 167 statements that survived the agreement level criterion.

2. The Delphi technique proved appropriate for bringing visual literacy experts to consensus regarding the elements, concepts and constructs of visual literacy. Given a set of statements from Round One, the participants significantly narrowed their degree of agreement when rating those statements in the next two rounds.

3. The very strong correlation between the level of agreement and the degree of consensus (r=.908) indicates that there is the most agreement on those constructs which are the most highly accepted.

4. The set of agreed-upon statements emanating from this study can be the basis for structuring a coherent theoretical base for visual literacy. No longer can the charge be made that there is no substance to visual literacy or that the emerging field of visual literacy has no conceptual foundations. If VL appears to lack these things, it is likely a reflection of an immature discipline rather than an unsubstantiated one. The constructs exist.

5. Notwithstanding statements to the contrary in the literature, there is a high level of agreement on most factors associated with visual literacy. The majority of participants agreed, strongly or moderately, with **all 186** statements generated by the first round of the study. Moreover, 167 statements were agreed upon at a statistically significant (p=.05) level. These exceptionally high agreement levels indicate that there is indeed much agreement about the constructs of visual literacy -- at least among that segment of the population who consider themselves knowledgeable about VL. The term "visual literacy" may forever be criticized by those who treat the words literally or who themselves want to impose a

definition. However, the term is widely understood and the meaning given to it is far more universal than the detractors imply.

The same is true regarding the makeup of visual literacy as a field. The elements, components, and theoretical constructs are agreed upon at a remarkably high level by those individuals recognized as visual literacy experts.

6. Phase II of the study generally validated the findings of Phase I. A second group of participants, using a different criterion for rating, supported (as important) the VL constructs identified by the Delphi group. The validation group ranked visual literacy statements similarly to the Delphi group for 151 of 186 items.

Summary

This study was initiated to examine the issue of apparent lack of agreement concerning what the critical components of visual literacy are. Contrary to the conclusion that could easily be drawn from a review of the existing literature, this study shows that, among the scholars who study visual literacy, there appears to be a great deal of agreement regarding its basic tenets.

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Date Filmed

March 21,1991